

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

**TITLE: DEMOUNTABLE TIRE RIM WITH A SPARE INNER WHEEL
AND TIRE FOR SAID TIRE RIM**

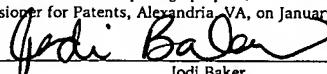
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Jodi Baker

1- I – Background of the invention

2- Field of invention.

3- The present invention relates to a tire rim which allows a vehicle to run with
4- a flat tire. More particularly, it relates to a **demountable tire rim with a**
5- **spare inner wheel and tire for said tire rim** which two main parts can
6- be easily disassembled to place or remove the spare inner wheel that is
7- placed into the wheel.

8- Description of prior art.

9- Within the prior art, there is US Patent 2105317 which discloses an aircraft
10- wheel made of two pieces. However, this tire rim is not apt to be used in
11- automobiles and in addition, it is not prepared to carry a spare inner wheel
12- inside.

13- US Patent 3037815 shows a wheel in which the tire rim has a thread to
14- vary the tread . This wheel is intended to be used in tractors and lacks the
15- spare inner wheel.

16- US Patent 4989657 is a modular wheel consisting of two main pieces and
17- a third piece to ensure the tire grip. These pieces are joined by means of
18- bolts but they lack other coupling means. It is not prepared for the assembly
19- of a spare inner wheel, either.

20- US Patent 5022450 discloses a set of safety tire rim and demountable
21- wheel. Both parts of the tire rim are joined by means of bolts and lack other
22- coupling means. There is an insert to run with the flat tire which is simply
23- added but does not determine the tire rim structure.

24- None of these well-known tire rims is prepared to have a spare wheel and
25- at the same time, be demountable with threaded or bayonet type coupling

1- means.

2- II – Summary of the invention

3- The present demountable tire rim with spare inner wheel comprises two
4- complementary annular parts provided with threaded reciprocal coupling
5- means. Both complementary annular parts form side holding edges for the
6- tire beads and in the central part, they form the assembly for one or more
7- spare wheels.

8- **Objects and Advantages.**

9- An advantage of the present tire rim is that it allows to place and easily re-
10- move the spare inner wheel.

11- Another advantage is that it simplifies the placement and removal of
12- tubeless tires which are easily performed and there is no need of using levers
13- as it usually occurs with one-piece tire rims. This is very significant in low
14- profile tires in which due to the height of their lateral walls, these ones are
15- less flexible making manipulation in conventional tire rims difficult.

16- A further advantage of the present tire rim is that it is provided with as-
17- sembly means like an annular depression wherein the spare inner wheel
18- wedges and slides which allows to run with tubeless tires without them be-
19- ing deteriorated. All the well-known similar systems, although having their
20- contact surfaces lubricated, do not have an annular depression for the spare
21- wheel to be slided relative to the tire rim. Therefore, contact between the
22- spare inner wheel and the tire causes its deterioration because the difference
23- in diameters causes a destructive attrition between both of them.

24- In addition, the present tire rim is compatible with different antifriction
25- means such as rollers at the base of the inner wheel or burnishings or anti-

1- friction coatings in the assembly means of said inner wheel. All this, on the
2- one hand, facilitates the relative sliding between the inner wheel and the tire
3- rim, and on the other hand, contact between the inner wheel and the tire,
4- thus avoiding deterioration of the tire.

5- The present tire rim is compatible with the use of inner wheels made of
6- different materials, namely plastic, thermoplastic, elastomer, flexible, semi-
7- flexible, semirigid or rigid. The use of these materials and the chance of in-
8- corporating easier holes allow the inner wheel to be resistant and at the same
9- time, light and safe.

10- This tire rim is also compatible with the use of spare inner wheels, either
11- one- piece or not, for instance, consisting of three or more sectors connected
12- to one another through flexible and strong bonding elements, which allow
13- them to behave like one-piece wheels and allow them to be warped, lessening
14- their major diameter so as to be placed and removed from the inside of
15- the tire which inner mouth has a shorter diameter.

16- Yet a further advantage of the present tire rim is high safety. This is due
17- to the fact that it is provided to complement threaded or bayonet type re-
18- ciprocal coupling means with a plurality of connection passages wherein
19- bolts with nut, lockpins, annular groove with cross section washer, etc. are
20- arranged.

21- A yet further advantage is that the present tire rim allows to form an
22- aerodynamic and aesthetic wheel and its conformation allows it to adapt to
23- measurements standarized by international regulations which govern the art.
24- And the modified tire is intended to decrease friction with the inner wheel,
25- determine a guided movement on it and decrease rotating displacement

1- with reference to the tire rim upon running under flat condition.
2-

III – Detailed description

3- As it can be observed in figures 1 and 2, the present invention is related to a
4- demountable tire rim (1) with spare inner wheel (3) which is integrated by
5- two complementary annular parts (4)(5) provided with threaded reciprocal
6- coupling means (10).

7- The body of the demountable tire rim (1) comprises two complementary
8- annular parts (4)(5) which consist of a first part (4) and a second part (5). Both
9- complementary annular parts (4) (5) are provided with each side holding rims
10- (6) (13) for the tire (2).

11- According to figure 7A, between the holding rim (6) or (13) and an adja-
12- cent rim (7a) a wedge is formed (7) for the tire (2) bead (51). The possibility
13- that the adjacent rim (7a) has gearing means (43) with similar means (53)
14- provided by the tire (2) bead (51) has been provided; this allows an integral
15- assembly between the tire rim (1) and the tire (2) (See figure 7b).

16- In the central part of the tire rim (1) there are assembly means for one or
17- more spare wheels (3). These assembly means comprise a central depression
18- (9). That may be even or grooved (17) limited by side edges (8) (12) and
19- central rims (15) which are supported against said side edges (8) (12). When
20- there are two or more spare wheels (3), separating rims (16) can be added
21- (16). (See figures 1, 2, 4, 5 and 6).

22- The two complementary annular parts (4) (5) have reciprocal coupling
23- means based on threads (10). (See figures 1 and 2). In one case, the recipro-
24- cal coupling means consist of each continuous threads (10) formed at the
25- above mentioned complementary annular parts (4) (5). In another case, the

1- reciprocal coupling means consist of a plurality of threaded sectors (40) on
2- the edge of the whole perimeter of both adjacent segments of the tire rim (1)
3- which have, on one of their ends, an elevated part as a stop (41), inserted
4- with sectors without thread (42), which surface is at a lower level in relation
5- to the threaded sectors (40), these ones being different sectors, of the same
6- width, so that they can be inserted to one another, to be fixed by means of
7- threading spindrift movements. (See figures 25A, 25B and 25C).

8- The reciprocal coupling means are complemented by means of intercon-
9- nection and fixation means (19) of the complementary annular parts (4)(5).
10- These interconnection and fixation means (19) comprise a plurality of equal
11- and equally-spacedly openings distributed on flanges placed on the perime-
12- ter of both edges, which, one opposite the other form passages for fixation
13- screws or for bolts with lockpin washer (See detail in figure 1 and figure 2).

14- In figures 1, 4, 5 and 6, it can be seen that both complementary annular
15- parts (4)(5) define a joint area (11) that may be even or with annular ledges.
16- The annular ledges can be facing or insertable. In this joint area, there is an
17- elastomeric joint (14) that may also be even or with annular ledges.

18- Concerning the spare wheel (3), it can be grooved (23)(24)(25) or even (22)
19- in one- piece, one- piece with recesses (29) on the even periphery (22), one-
20- piece with recesses (30) on the inner edge (23) or either comprised by sectors
21- related to an annular member which goes through them.

22- Different examples of spare wheels (3) are illustrated in figures 7, 8, 9, 10,
23- 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24.

24- With regard to the tire, in addition to the gearing means (53), it possesses
25- a reinforcement annular member (52) arranged within the bead (51) (See fig-

1- ures 3 and 7B).

2- In Figures 1 and 2, some inner ledges (50) of the above mentioned tire (2)
3- can be seen to face and facilitate contact with the spare wheel (3) under flat
4- tire running conditions.

5- It is evident that when the present invention is put into practice, modifi-
6- cations may be made regarding certain construction and shape details, with-
7- out departing from the basic principles which are clearly encompassed in the
8- following claims.

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